

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application:

Confirmation No.: 3134

Jorge Gustavo VIGIL et al.

Group Art Unit: 1616

Serial No.: 10/714,870

Examiner: Sabiha Naim QAZI

Filed: November 18, 2003

Atty. Dkt. No.: P69259US0

For: SOLID HERBICIDAL FORMULATION OF N-(PHOSPHONO-METHYL)GLYCINE AND PROCESS FOR ITS PREPARATION

DECLARATION UNDER 37 C.F.R. § 1.132

1. I, Jorge Gustavo Vigil, am a citizen of Argentina and reside at Bulnes 1950 - 6th Floor "C", Buenos Aires, Argentina 1425.
2. I am one of the co-inventors in the above-referenced U.S. patent application Serial No. 10/714,870, which is based on a prior Argentina application P 02 01 04441, filed on November 19, 2002.
3. I am an expert in the field of agrochemical products and processes for their preparation for about 17 years. My professional resume is enclosed.
4. I am familiar with the above-referenced U.S. patent application Serial No. 10/714,870 and the reference of Townson et al. (U.S. Patent 5,888,934) cited by the Examiner.
5. A reasonable interpretation of the content of column 6, lines 59 to 67 of Townson as cited by the Examiner by a person of ordinary skill in the art indicates that it fails to disclose or suggest a dry mixing method as claimed in the present application. More specifically, the cited content states that, to prepare solid compositions, one ought to mix the active ingredient, which is glyphosate or a salt thereof, with an inorganic diluent and perhaps with a wetting agent. It does not provide any suggestion on how to prepare the glyphosate salt beforehand. In fact, Townson patent discloses a process for preparing solid formulations comprising at least two steps: the preparation of the glyphosate salt and mixing the glyphosate salt with other ingredients. Townson only discloses the conventional wet method for preparing the glyphosate salt. It then discloses mixing the glyphosate salt made by the wet method with other ingredients. The Townson patent, as illustrated by all its examples, aims at preparing liquid herbicide formulations containing glyphosate trimethylsulfonium salt.
6. Additionally, Townson patent does not provide any suggestion on whether the making of the preparation could be done simultaneously with the adding of the

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inorganic diluent and the wetting agent. The present application discloses a process comprising the neutralization reaction simultaneously with the formulation of the product in only one step. Townson patent does not suggest a skilled artisan to undergo a neutralization chemical reaction of the glyphosate for preparing the glyphosate ammonium salt simultaneously with the adding of the inorganic diluent and the wetting agent, let alone the possible existence of technical difficulties in preparing the solid formulation by the wet method as explained below.

7. Furthermore, when Town patent refers to the use of a water-insoluble inorganic diluent (kaolin, bentonite, etc.), it clearly teaches that the purpose is to prepare dispersible solid formulates, i.e. formulates forming a suspension, wherein the purpose of the diluent (an inert substance ...according to the definition of the Dictionary of Science and Technical Terms, MacGraw Hill, Second Edition, see enclosed copy) is to augment the volume of the formulate and, when a wetting agent is present, to favor its dispersion in water.
8. The Townson patent does not specifically disclose the possibility of using a solid surface-active agent in the preparation process of the solid compositions. The cited paragraph on column 7, lines 1 - 11 of Townson patent discloses only the use of surface-active agent in water. Townson patent does not disclose or suggest the possibility of using a solid surface-active agent in preparation of solid glyphosate salt formulation by a dry mixing method including one sole step of neutralization of glyphosate with ammonium bicarbonate and the adding of a solid surface-active agent (tensionactive agent) at a room temperature. The presence of the surface-active agent is aimed at improving the absorption of the herbicidal agent on the surfaces of the treated plants.
9. The present application relates to a process for preparing solid herbicidal formulations, by a dry mixing method, which solves surprisingly, unexpectedly, simply and at a low cost the technical difficulties posed by the conventional wet method of prior art including the method in the Townson patent. The specific technical difficulties of the wet method have been enumerated in the specification of the present application, for example, on page 3, lines 10 - 16.
10. The inventors of the present application have found that the wet method of prior art encounters technical difficulties because such method was performed in a reactor, in a wet way, by mixing the ingredients aiming to obtain an herbicidal formulation that could later be handled to be conditioned in the form of powders and or granules. Hence, when glyphosate with a neutralization base and a liquid surface-active agent, such as a liquid wetting agent, are mixed in a reactor, even in the presence of minimal quantities of water, a humid and sticky paste is produced, which has a very high viscosity and sticks to the walls of the reactor, thus requiring high quantities of energy for its correct mixing.

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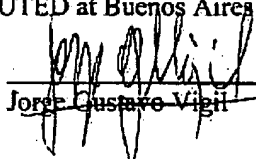
11. Another problem with the wet method is that the heat unleashed by the exothermic neutralization reaction of the glyphosate with the base causes the temperature of the mixture to rise quickly, which cannot be controlled by conventional refrigeration methods because of the formulation of a viscous layer that stuck to the walls of the reactor and of the stirring tools, thereby impeding the efficient transfer of heat from the inside of the mixture to the outer refrigeration means of the reactor.
12. To solve all these problems, the inventors of the present invention, unexpectedly and surprisingly, discovered that when a substantial water-free reaction mixture was processed by mixing the glyphosate with ammonium bicarbonate and a solid surface-active agent at a room temperature, none of the above disadvantages occurred.
13. As a matter of fact, when the ingredients, i.e. glyphosate, ammonium bicarbonate and the solid surface-active agent, were mixed, what was produced was a freely flowing solid mixture in the form of a powder, which could be easily mixed in rotating drums or by mixing blades, and whose temperature was also easily controlled because of the efficient heat transfer outwards which made the particulate texture of the resulting mixture possible. It is important to keep the temperature of the mixture between 20 - 30°C because the ammonium glyphosate appears as a fluid powder at such temperature, which is different from what happens when temperature are above 45°C, at which the mixture turns sticky.
14. It is respectfully submitted that, when evaluating the characteristics of the process claimed in the present invention, the Examiner should take into account of the physical form of the solid ingredients used in the claimed method and the applications exemplified in the specification. They are raw materials appeared in the form of powders (enclosed please find the copies of the product specifications provided by the producers of Geropon T/77, of Geropon SDS and ATAPLUS UCL 1007).
15. Furthermore, surprisingly and unexpectedly, it is thought that the minimal quantities of water present in the technical grade glyphosate that were used as the raw material in the claimed method, make it possible to begin gradually and efficiently the neutralization reaction between glyphosate and ammonium bicarbonate, which reaction was also notably favored up to its finalization by the release of carbon anhydride facilitating the solid-solid contact and by keeping the temperature between 20 - 30°C, thereby making it possible for the mixture to behave at any time as a fluid powder, unlike the humid way processes of the prior art where it is necessary to supply heat in order to eliminate the water, which results in a sticky mixture that is difficult to handle.
16. The surprising result of these two effects - the intimate mixture of a particulate mixture and the complete chemical reaction of the ingredients in solid condition, has neither been disclosed nor suggested in prior art, including the Townson

patent. The processes in the prior art have always taken place essentially in a fluid medium in order to guarantee the intimate and complete mixture of the ingredients but which do entail the above mentioned disadvantages. The final solid formulations obtained as a result of steps a) and b) of the claimed method, which comprises the mixing and kneading of the ingredients, is a formulation that can easily be handled for its final transformation into granules, powders or scales.

17. Regarding the definition of the term "tensioactive agent" inquired by the Examiner, it is respectfully submitted that applicant has used the term "tensioactive agent" as a translated term into English from the Spanish term "agente tensioactivo" (see priority document), which is a term commonly used in the industry. It refers to an agent modifying the surface interfacial tension of water and other liquid or solid substances. The English as well as the Spanish term is equivalent to the terms "surface active agent" in English or "agente activo superficial" in Spanish, as this can be seen from the enclosed copy of a page with the definition of the term "surfactant" appearing in Chambers Technological Dictionary. Therefore, the term "tensioactive agent" has a meaning that is clear to a person of ordinary skill in the art. Consequently, it is not necessary to include a definition in the specification of the present application.
18. In summary, one of ordinary skill in the art will understand that the present invention as claimed in the above-referenced U.S. patent applications Serial No. 10/714,870 relates to a preparation method for solid glyphosate salt formulation by a dry mixing method including mixing solid glyphosate, a solid neutralization base, such as ammonium bicarbonate, and solid tensioactive agent (surface active agent) at about 20 - 30°C, preferably 25°C. This method is neither disclosed or suggested by the Townson patent.
19. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issuing thereon.

EXECUTED at Buenos Aires this 9 day of September, 2005.

By


Jorge Gustavo Vigil

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CURRICULUM VITAE

PERSONAL DATA:

NAME: Jorge Gustavo Vigil
COMPANY: ATANOR S.A.
POSITION: Research & Development Director
AGE: 61
NATIONALITY: Argentinian
MARITAL STATUS: Married – 3 children

EDUCATIONAL BACKGROUND

High School: Colegio Nacional Juan M. De Pueyrredón, 1962
College: U.N.B.A.- Chemical Engineer, 1968
Post-graduate Courses: Preparation and evaluation of Investment Projects.
Factibility Studies (C.I.M.E.)- 1970
Accounts and costs for non-accountants (CYANAMID) 1979
Administration and Personnel Assessment (CYANAMID), 1980
Jobs done abroad: Scholarship of the United Nations to do research and development works, and economic-technical assessments of projects (9/1970-6/1971)
Italy - Technical Assessment of the aluminium plant to be built in Puerto Madryn (7/1972)

WORK EXPERIENCE

9/1967 – 2/1972 INSTITUTO NACIONAL DE TECNOLOGIA INDUSTRIAL
Position: Senior Engineer, Development Dept. Laboratory chief, light metals

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Laboratory tasks, pilot plant and post technical & economic assessment

2/1972 – 8/1974

COPEDESMEI

Position: Technical Consultant of the Presidency – chief of Puerto Madryn delegation

Supervision of works and start-up of Aluar S.A. Advice to the Presidency and coordination works with National and Provincial Institutions

8/1974 – 2/1977

MINERA AGUILAR GROUP

COMPAÑIA METALURGICA AUSTRAL ARGENTINA

Position: Research & Development chief

Taks: Development of new processes and products. Optimization of production activities. Pilot plant. Elaboration of Production Standards, etc.

2/1977 – 11/1980

CYANAMID DE ARGENTINA S.A.

The company synthesizes and elaborates chemical products.

Position: Technical Manager – Manager of chemical plant (consecutive jobs)

Areas involved in the above-mentioned position:

- Production
- Development
- Process and Design Engineering
- Pilot Plant

11/1980 – 2/1984

MICROSULES ARGENTINA S.A. (synthesis of chemical-pharmaceuticals products and elaboration)

Plant Manager: In charge of the following areas:

- Production
- Process Engineering – Project Engineering
- Plant Engineering – Maintenance
- Costs – Planning
- Storage – Despatch

2/1984 – 8/1987

PROTOQUIM S.A. (production of chemical products, which are raw-material for the plastic and rubber industries)

Position: Plant Manager, in charge of the following departments:

- Production
- Development
- Process Engineering
- Plant Engineering – Maintenance

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- Costs – Planning
- Storage – Despatch

11/87 - 9/05

ATANOR S.A. (chemical, petrochemical and agrochemical products)

Position: Research & Development Director, in charge of:

- Development Laboratory
- Standard Requirements
- Process Engineering
- Quality Control Laboratory

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PRODUCT INFORMATION BULLETIN

TENTATIVE

ATPLUS® UCL1007

Agriculture Adjuvant/Wetting Agent for Dry Flowables

Tentative Specifications

Water Content, % (K.F.)

5.0 max.

General Characteristics

Appearance @ 25 deg. C

Classification

Fineness, % Passing US No. 20 Sieve

Melt Point, deg. F

pH. 1% Aqueous

Free flowing powder

Nonionic surfactant

Approx. 90 min.

Approx. 180

Approx. 4 - 6

Solubilities*

Soluble in Ethylene Glycol, Lower Alcohols and Water. Insoluble in Acetone, Mineral Oils, Petroleum Solvents and Vegetable Oils.

* 10% solution - weight/weight

Safe Handling Information

**FOR HAZARD COMMUNICATION INFORMATION AND HANDLING INSTRUCTIONS READ
THE ICI AMERICAS INC. MATERIAL SAFETY DATA SHEET**

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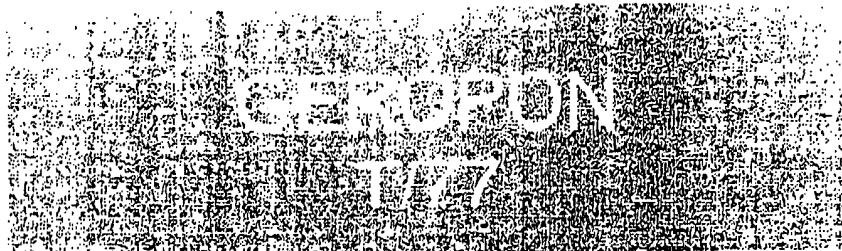
9/99 USA Item No. 81097

ATPLUS is a registered trademark, the property of ICI Americas Inc., a subsidiary of Imperial Chemical Industries PLC



Uniquema is an international business of Imperial Chemical Industries PLC. Uniquema operates through ICI affiliated companies in the relevant countries such as ICI Americas Inc., Uniquema Americas Inc., and Mona Industries in the USA.

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**PRODUCT DATA SHEET RG FP FB0701 - April 2000****IDENTIFICATION****SODIUM N-METHYL-N-OLEYL-TAURATE**

CAS N° 137 - 20 - 2

SPECIFICATIONS

| | |
|-----------------------------------|--|
| RPG02 pH (2% in water) | 8.5 - 8 |
| RPG12 Active content (%) | 67 - 76 |
| RPG93 Sodium oleate (%) | 2 - 5 |
| Bulk density (g/cm ³) | 0.6 - 0.7 |
| Aspect | Cream colored powder free from particulate contamination |

PHYSICO-CHEMICAL PROPERTIES

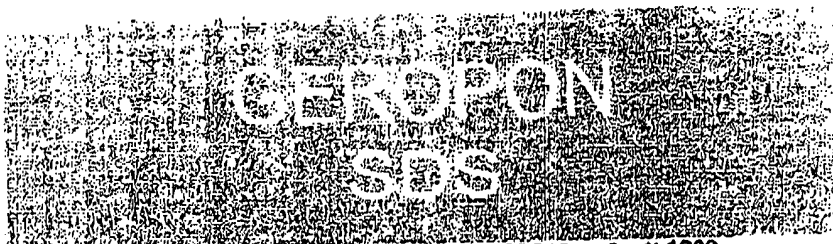
| | |
|------------------|--|
| Ionic character | Anionic |
| Flash point (°C) | > 100 |
| Solubility | Soluble in water. Insoluble in polar and aromatic solvents. |

**Home, Personal Care & Industrial Ingredients**

RHODIA HPCOL, 40, rue du In Mole-Cog F-93306 Aubervilliers Cedex. Tél : +33 1 53 98 50 00 Fax : +33 1 53 96 55 55
Société par Actions Simplifiée au capital de 20 871 780 Euros - RCS Nanterre B428766356

Product data sheet : FB0701.DOC

Page 1



PRODUCT DATA SHEET RG FP FG0131 - April 1999

IDENTIFICATION

SODIUM DIOCTYLSULPHOSUCCINATE

SPECIFICATIONS

| | |
|--------------------------------------|-----------|
| RPG16 Water content (K. Fischer) (%) | 2 max. |
| RPG02 pH (5 % in water) | 5.0 - 7.0 |

PHYSICO-CHEMICAL PROPERTIES

| | |
|-----------------------------------|--|
| Character | Anionic |
| Physical form at 20°C | Powder |
| Active content (%) | 85 approx. |
| Flash point (°C) | > 100 |
| Bulk density (g/cm ³) | 0.9 |
| Solubility | Soluble in water. Insoluble in polar and aromatic solvents. |

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Home, Personal Care & Industrial Ingredients

RHODIA HPCII, 40, rue de la Haie-Coq F-93308 Aubervilliers Cedex. Tél : +33 1 53 66 00 00 Fax : +33 1 53 66 55 96
Société par Actions Simplifiée au capital de 20 871 780 Euros - RCS Bobigny B428766366

Product data sheet : FG0131.DOC

Page 1

CHAMBERS

DICCIONARIO TECNOLÓGICO

ESPAÑOL - INGLÉS - FRANCÉS - ALEMÁN

COMPRENDE LA TERMINOLOGÍA EMPLEADA
EN LAS CIENCIAS PURAS Y APLICADAS, MEDI-
CINA, PRINCIPALES INDUSTRIAS, INGENIE-
RÍA, CONSTRUCCIÓN Y OFICIOS MECÁNICOS

REDACTADO POR COMPETENTES ESPECIALISTAS

DIRIGIDO POR

C. F. TWENEY

Director de *A Technological and Scientific
Dictionary, Standard Books, etc.*

Y

L. E. C. HUGHES

Ex lector de Comunicaciones eléctricas en el
City and Guilds College y en el *Imperial College
of Science and Technology*, de Londres

LA TRADUCCIÓN ESPAÑOLA HA SIDO DIRIGIDA POR

CARLOS BOTET

Ingeniero

TOMO PRIMERO



EDICIONES OMEGA, S. A.

CASANOVA, 220 - BARCELONA

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ha sido publicada en inglés con el título*

**CHAMBERS'S
TECHNICAL DICTIONARY**

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Núm. Registro: 398-64

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GRÁFICAS CONDAL - C/ot, 102 y 104 - BARCELONA

surco

che) (Zool.). Surco entre el manto y el cuerpo en los bivalvos.

surco primitivo (primitive groove; goudière primitive; Primuriviere) (Zool.). Surco superficial que corre a lo largo de la esctría media de la línea primitiva.

surculoso (surculose; surculeux; einseitig) (Bot.). Que lleva tallos.

surculo (surculus; surcule; Pflanzenstiel) (Bot.). Tallo.

surfactant (Quim.). Abreviatura inglesa de agente activo superficial (surface active agent), es decir, sustancia que tiene el efecto de alterar la tensión superficial interplanar del agua y otros líquidos o sólidos, p. ej., un detergente o jabón.

surra (surra; surra; Surra) (Vet.). Enfermedad de los caballos, mulos y camellos, debida a la infección por la *Trypanosoma evansi*.

surrosión (surrosion; surrosion; Surrosion) (Quim.). Aumento de peso producido por la corrosión.

surtido (Text.). Dícese del conjunto de máquinas necesarias para cardar la lana y obtener hilos de lana.

surtidor (Jet; jet; gicleur; Düse) (Mots. C. I.). Tobera pequeña, como el *surtidor* o *chicler* de un carburador. *surtidor* de compensación (compensating jet; gicleur de compensation; Ausgleichdüse) (Mots. C. I.). Surtidor de gasolina auxiliar, utilizado en algunos carburadores a fin de incrementar la recarga del surtidor principal, cuando es baja la proporción de aire, y mantener la constante riqueza de la mezcla. Véase carburador.

susceptibilidad (susceptibility; susceptibilité; Empfänglichkeit) (Bot.). El conjunto de las propiedades de una planta que la ponen en situación de sufrir los ataques de un parásito.

susceptibilidad diferencial (differential susceptibility; susceptibilité différentielle; differentielle Suszeptibilität) (Electrotecn.). La relación existente entre una pequeña variación de la intensidad de imanación de un material magnético y la variación de la fuerza magnética que la produce, es decir, el valor de la tangente al ciclo de imanación en el punto considerado.

susceptibilidad magnética (susceptibility; susceptibilité magnétique; magnetische Suszeptibilität) (Electrotecn.). Razón de la intensidad de imanación a la fuerza del campo magnético, en un circuito magnético.

suscriptor (party; subscriber; Subskribent) (Telef.). Nombre primitivo del abonado.

suspendido (suspend; suspendu; gehängt) (Bot.). Dícese del óvulo que cuelga de lo alto del ovario.

suspensión (suspension; suspension; Aufhängung) (Automovilismo). Conjunto de órganos (ballestas, amortiguadores), que se interponen entre el bastidor y los ejes de ruedas, para reducir las sacudidas y trepidaciones producidas por las desigualdades del terreno.

suspensión (hanger; suspension; Aufhängung) (Electrotecn.). Dispositivo que sirve para sostener el conductor de trabajo en una línea aérea de tracción eléctrica, ya sea desde un cable transversal, o bien desde una estructura también transversal.

suspensión (suspension; suspension; Suspension) (Química). Sistema en que las partículas más densas y de tamaño al menos visible al microscopio, se hallan distribuidas a través de un líquido o gas menos denso, estando impedida su sedimentación, sea por la viscosidad del líquido, sea por los impactos de sus moléculas sobre las partículas en cuestión.

suspensión aislante (insulated hanger; suspension isolée; isolierte Aufhängung) (Electrotecn.). Suspensión del conductor de trabajo, en tracción eléctrica, de forma que quede éste aislado de los soportes.

suspensión bifilar (bifilar suspension; suspension bifilaire; bifilare Aufhängung) (Fis.). La suspensión de un cuerpo por dos alambres o hilos verticales paralelos que proporcionan un par de fuerza considerable. Si los hilos son de largo l y están entre sí a una distancia d , el período de vibración torsional de un cuerpo suspendido, de momento de inercia I y de masa m es:

$$T = 4\pi \sqrt{\frac{I \cdot l}{m \cdot g \cdot d^2}}$$

suspensión

suspensión Brocot (Brocot suspension; suspension Brocot; Brocot-Aufhängung) (Reloj.). Suspensión de longitud variable, ajustable por el frente de la esfera.

suspensión catenaria (catenary construction; suspension caténaire; Kettenaufhängung) (Electrotecn.). Método de suspensión empleado para las líneas aéreas de tracción. Un cable está suspendido formando una catenaria entre dos soportes, y suspendido de él, horizontalmente, por medio de péndulos de longitud variable, está dispuesto el cable de trabajo. Véase catenaria compuesta.

suspensión catenaria doble (double-catenary construction; suspension caténaire double; Kettenaufhängung mit doppeltem Tragseil) (Electrotecn.). Sistema de suspensión de la línea de contacto empleado en tracción eléctrica, en que el cable de trabajo está soportado por dos catenarias paralelas, estando dispuestos los tres cables según los vértices de un triángulo.

suspensión catenaria simple (single-catenary suspension; suspension caténaire simple; Einkettenaufhängung) (Electrotecn.). Sistema de suspensión catenaria en que el hilo conductor cuelga de un solo alambre catenaria sustentador.

suspensión central (centre-pole suspension; suspension centrale; Mittelaufhängung) (Electrotecn.). Suspensión del conductor de trabajo de una línea de tranvías eléctricos, cuando los postes están emplazados entre dos vías.

suspensión de barra (bar-suspension; suspension à barre; Barrenaufhängung) (Electrotecn.). Especial método de montaje del motor en un vehículo de propulsión eléctrica. El motor decaesa sobre dos apoyos, uno de ellos situado en el propio eje motor y el otro en el chasis, mediante una barra de suspensión elástica transversal.

suspensión de la culata (yoke suspension; suspension de joug; Jochaufhängung) (Electrotecn.). Véase suspensión de barra.

suspensión de péndulo (pendulum spring; suspension à pendule; Pendelaufhängung) (Reloj.). La delgada cinta de acero usada para suspender el péndulo.

suspensión directa (direct-suspension construction; suspension directe; unmittelbare Aufhängung) (Electrotecn.). Sistema de suspensión de la línea aérea en tracción eléctrica, en que el cable de trabajo está suspendido directamente de los soportes, sin la intervención de ningún cable portador o catenaria.

suspensión elástica (cushioning; suspension élastique; elastische Aufhängung) (Acúst.). Empleo de materiales elásticos para aislar dispositivos sensibles, tales como microfones y registradores o grabadores, de la influencia de vibraciones externas.

suspensión elástica (bowstring suspension; suspension élastique; elastische Aufhängung) (Electrotecn.). Sistema de suspensión del cable de trabajo en las líneas de tranvías eléctricos. El cable conductor está suspendido de unos cables transversales de acero de corta longitud, fijados por sus extremos en los brazos de los postes.

suspensión flexible (flexible suspension; suspension flexible; biegsame Aufhängung) (Electrotecn.). Método de suspensión del cable de trabajo en tracción eléctrica, que le permite tener cierto movimiento relativo, vertical y horizontal, con respecto a los soportes fijos.

suspensión independiente (independent suspension; suspension indépendante; Einzelaufhängung) (Automovilismo). Sistema de suspensión en el cual las ruedas no están conectadas por un eje, sino montadas separadamente en el bastidor por medio de ballestas y bielas de suspensión, de manera que puedan efectuar movimientos verticales independientes.

suspensión magnética (magnetic suspension; suspension magnétique; magnetische Aufhängung) (Electrotecn.). Dispositivo en el que se utiliza la acción de un iman como medio de ayuda al soporte de una carga vertical; p. ej., el eje vertical de un contador, de cuya manera se descarga la piedra dura (generalmente zafiro), encajada en el fondo de la quicionera, de parte de la presión que sobre la misma gravita.

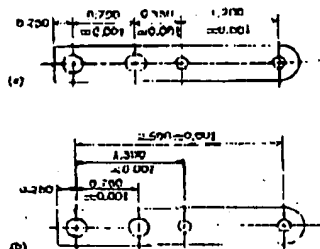
suspensión por barra de torsión (torsion bar suspension; suspension sur barre de torsion; Drehstabfederung) (Autom.). Sistema de ballestas, usado en algunas suspensiones independientes, en el que se someten a torsión unas barras rectas, sujetas por uno de sus extremos,

Dilleniaceae

1,3-dimethylbenzene

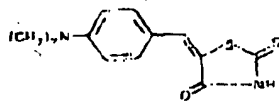
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DIMENSIONING



Two standard methods for marking dimensions on mechanical drawings.
(a) Point-to-point dimensioning.
(b) Datum dimensioning.

PARA-DIMETHYLAMINO-BENZALRHODANINE



Structural formula.

leaf in the family Umbelliferae. The aromatic leaves and roots are used for food flavoring.

Dilleniaceae [BOT] A family of dicotyledonous trees, woody vines, and shrubs in the order Dilleniaceae having hypogynous flowers and mostly entire leaves.

Dilleniaceae [BOT] An order of dicotyledonous plants in the subclass Dilleniidae characterized by separate carpels and numerous stamens.

Dilleniidae [BOT] A subclass of plants in the class Magnoliopsida distinguished by being syncarpous, having centrifugal stamens, and usually having bitegmic ovules and binucleate pollen.

dill oil [MATER] A yellowish essential oil, soluble in propylene glycol, slightly soluble in glycerine, obtained by steam distillation of the dill plant *Anthriscum graveolens*; chief ingredient for carvone. Also known as American dillweed oil; anethum oil.

diluent [CHEM] An inert substance added to some other substance or solution so that the volume of the latter substance is increased and its concentration per unit volume is decreased.

dilute [CHEM] To make less concentrated.

dilute phase [CHEM ENG] In liquid-liquid extraction, the liquid phase that is dilute with respect to the material being extracted.

dilution [CHEM] Increasing the proportion of solvent to solute in any solution and thereby decreasing the concentration of the solute per unit volume. [MET] The use of a welding filler metal deposit with a base metal or a previously deposited weld material having a lower alloy content. [OPTICS] Reducing the intensity of a color by adding white.

dilution gene [GEN] Any modifier gene that acts to reduce the effect of another gene.

dilution method [MICROBIO] A technique in which a series of cultures is tested with various concentrations of an antibiotic to determine the minimum inhibiting concentration of antibiotic.

DIM (See nonthermal decimetric emission).

dimedone See 5,5-dimethyl-1,3-cyclohexanedione.

dimension [GRAPHICS] In a mechanical drawing, a labeled measure in a straight line of the breadth, height, or thickness of a part, the angular position of a line, or the location of a detail such as a hole or brace.

dimensional analysis [PHYS] A technique that involves the study of dimensions of physical quantities, used primarily as a tool for obtaining information about physical systems too complicated for full mathematical solutions to be feasible.

dimensional constant [PHYS] A physical quantity whose numerical value depends on the units chosen for fundamental quantities but not on the system being considered.

dimensional formula [PHYS] The expression of a derived quantity as a product of powers of the fundamental quantities.

dimensional stability [GRAPHICS] The percentage of change in size of paper under two different conditions of temperature and humidity. [TEXT] Shape-retaining quality of material.

dimension declaration statement [AOL] A FORTRAN statement identifying arrays and specifying the number and bounds of the subscripts.

dimensioning [GRAPHICS] Arranging of dimensions to a mechanical drawing.

dimensionless group [PHYS] Any combination of dimensional or dimensionless quantities possessing zero overall dimensions; an example is the Reynold's number.

dimensionless number [MATER] A ratio of various physical properties (such as density or heat capacity) and conditions (such as flow rate or weight) of such nature that the resulting number has no defining units of weight, rate, and so on. Also known as nondimensional parameter.

dimension line [GRAPHICS] A line on a drawing pointing to another line or part to which the dimensions relate.

dimension of a simplex [MATH] One less than the number of vertices of the simplex.

dimension of a vector space [MATH] The number of vectors in any basis of the vector space.

dimensionless [PHYS] The product of powers of fundamental quantities (or of convenient derived quantities) which are

used to define a unit are often mass, length, time, and temperature. dimension stone blocks of stone paving stone, on dimension theory dimension, white dimer [CHEM] A molecule.

dimeric apol [PH] A colorless, water-soluble, used as a poisoner. Also dimeric water.

dimeric water [PH] A colorless, water-soluble, used as a poisoner. Also dimeric water.

dimerization [CHEM] A process in which two molecules combine to form a dimer.

dimerous [CHEM] A process in which two molecules combine to form a dimer.

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